PATENT COOPERATION TREATY

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INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY
(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference	FOR FURTHER ACTION See Form PCT/IPEA/416	
International application No. PCT/FI2004/000256	International filing date *(day/month/year)* 27.04.2004	Priority date *(day/month/year)* 01.07.2003
International Patent Classification (IPC) or national classification and IPC D21H 27/10, B65D 65/42		
Applicant Stora Enso Oyj et al		

1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.
2. This REPORT consists of a total of 3 sheets, including this cover sheet.
3. This report is also accompanied by ANNEXES, comprising:
   a. ☒ *(sent to the applicant and to the International Bureau)* a total of 3 sheets, as follows:
      ☒ sheets of the description, claims and/or drawings which have been amended and are the basis of this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).
      ☐ sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.
   b. ☐ *(sent to the International Bureau only)* a total of (indicate type and number of electronic carrier(s))
      _____, containing a sequence listing and/or tables related thereto, in electronic form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).
4. This report contains indications relating to the following items:
   - ☒ Box No. I Basis of the report
   - ☐ Box No. II Priority
   - ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
   - ☐ Box No. IV Lack of unity of invention
   - ☒ Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
   - ☐ Box No. VI Certain documents cited
   - ☐ Box No. VII Certain defects in the international application
   - ☐ Box No. VIII Certain observations on the international application

Date of submission of the demand	Date of completion of this report
27.04.2005	28.09.2005
Name and mailing address of the IPEA/SE Patent- och registreringsverket Box 5055 S-102 42 STOCKHOLM Facsimile No. +46 8 667 72 88	Authorized officer Mats Raidla/Els Telephone No. +46 8 782 25 00

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.
PCT/FI2004/000256

Box No. I Basis of the report

1. With regard to the **language**, this report is based on:

☒ the international application in the language in which it was filed

☐ a translation of the international application into _____ ,
which is the language of a translation furnished for the purposes of:

☐ international search (Rules 12.3(a) and 23.1(b))

☐ publication of the international application (Rule 12.4(a))

☐ international preliminary examination (Rules 55.2(a) and/or 55.3(a))

2. With regard to the **elements** of the international application, this report is based on *(replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report):*

☐ the international application as originally filed/furnished

☒ the description:

pages 1-16 as originally filed/furnished

pages* _____ received by this Authority on _____

pages* _____ received by this Authority on _____

☒ the claims:

pages _____ as originally filed/furnished

pages* _____ as amended (together with any statement) under Article 19

pages* 18-20 received by this Authority on 29-08-2005

pages* _____ received by this Authority on _____

☐ the drawings:

pages _____ as originally filed/furnished

pages* _____ received by this Authority on _____

pages* _____ received by this Authority on _____

☐ a sequence listing and/or any related table(s) – see Supplemental Box Relating to Sequence Listing.

3. ☐ The amendments have resulted in the cancellation of:

☐ the description, pages _____

☐ the claims, Nos. _____

☐ the drawings, sheets/figs _____

☐ the sequence listing *(specify)*: _____

☐ any table(s) related to the sequence listing *(specify)*: _____

4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).

☐ the description, pages _____

☐ the claims, Nos. _____

☐ the drawings, sheets/figs _____

☐ the sequence listing *(specify)*: _____

☐ any table(s) related to the sequence listing *(specify)*: _____

* *If item 4 applies, some or all of those sheets may be marked "superseded."*

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.
PCT/FI2004/000256

Box No. V **Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

1. Statement

Novelty (N)	Claims	1-19	YES
	Claims		NO
Inventive step (IS)	Claims	1-19	YES
	Claims		NO
Industrial applicability (IA)	Claims	1-19	YES
	Claims		NO

2. Citations and explanations (Rule 70.7)

Documents cited in the International Search Report:
D1: WO 0149938 A1
D2: WO 02090206 A1
D3: EP 0292975 A1
D4: FI 112048 B

The cited documents represent the general state of the art. The invention defined in amended claims 1-19 is not disclosed by any of these documents.

The cited prior art does not give any indication that would lead a person skilled in the art to the claimed heat treated package formed from fibre based packaging material. Therefore, the claimed invention is not obvious to a person skilled in the art.

Accordingly, the invention defined in amended claims 1-19 is novel and is considered to involve an inventive step. The invention is industrially applicable.

Claims

1. An autoclave package, comprising a fibre-based packaging material treated with a hydrophobic size and comprising on the inside and/or outside of the fibre substrate one or more layers for reduced water penetration, the package having been treated under pressure at a temperature of 100 to 250 °C for a time of 5 min to 30 h, **characterised** in that the fibre substrate has been treated with a hydrophobic size, an aluminium compound and a wet-strength size for increased heat resistance of the packaging material, and in that the weight ratio of hydrophobic size to the aluminium compound is 1:0.1–1:10.

2. A package as defined in claim 1, **characterised** in that the weight ratio of hydrophobic size to aluminium compound is 1:0.1–1:7, preferably 1:0.5–1:5, more advantageously 1:1–1:5, and most advantageously 1:1–1:3.

3. A package as defined in claim 1 or 2, **characterised** in that hydrophobic size is used in an amount of 0.3–4 kg/t of dry fibre substrate, preferably 0.5–3.0 kg/t of dry fibre substrate, such as 0.5–1.7 kg/t of dry fibre substrate.

4. A package as defined in any of the preceding claims, **characterised** in that the hydrophobic size is a size consisting of alkenyl succinic acid anhydride (ASA) and/or alkyl ketene dimer (AKD).

5. A package as defined in any of the preceding claims, **characterised** in that the hydrophobic size is an ASA size.

6. A package as defined in any of the preceding claims, **characterised** in that aluminium compound has been used in an amount of 1.0–20 kg/t of dry fibre substrate, preferably 1.0–10 kg/t of dry fibre substrate 2.0–8 kg/t of dry fibre substrate.

7. A package as defined in any of the preceding claims, **characterised** in that the aluminium compound is aluminium salt, preferably alum.

8. A package as defined in any of the preceding claims, **characterised** in that wet-strength size has been used in an amount of 0.2–12 kg/t of dry fibre substrate, preferably 0.5–6 kg/t of dry fibre substrate, more advantageously 1–3 kg/t of dry fibre substrate.

9. A package as defined in any of the preceding claims, **characterised** in that the wet-strength size contains polyamido amine epichlorine hydrine resin (PAAE size).

10. A package as defined in any of the preceding claims, **characterised** in that the layer for reduced water penetration of the packaging material is a polymer coating.

11. A package as defined in any of the preceding claims, **characterised** in that the packaging material comprises in the following order: a polymer heat-sealing layer, a white-pigmented polymer layer, a polymer layer containing black pigment, a treated fibre substrate, one or more polymer oxygen-barrier layers, a binder layer, a grey-pigmented polymer light-shield layer and a polymer heat-seal layer.

12. A package as defined in any of the preceding claims, **characterised** in that a filler has been added to the fibre substrate for increased heat resistance of the package.

13. A package as defined in any of the preceding claims, **characterised** in that the fibre substrate is made of wrapping paper or board.

14. A packaging material intended for autoclave packages, comprising a fibre substrate treated with a hydrophobic size and coated at least on one side with a layer for reduced water penetration, **characterised** in that the fibre substrate of the packaging material has been treated with a hydrophobic size, an aluminium compound and a wet-strength size for increased heat resistance of the packaging material, and in that the weight ratio of hydrophobic size to the aluminium compound is 1:0.1-1:10.

15. A method for manufacturing a fibre-based packaging material intended for an autoclave package, the method comprising treatment of the fibre substrate with a hydrophobic size and coating of at least one side of the fibre substrate with a layer for reduced water penetration, such as a polymer layer, **characterised** in the fibre substrate is treated with a hydrophobic size, an aluminium compound and a wet-strength size for increased heat resistance of the packaging material, and in that the weight ratio of hydrophobic size to the aluminium compound is 1:0.1-1:10.

16. A method as defined in claim 15, **characterised** in that the heat resistance of the package is further enhanced by controlling the structure of the fibre substrate by means of refining, wet-pressing, calendering and/or Condebelt drying of the pulp.

17. A method as defined in claim 15 or 16, **characterised** in that a filler is added to the fibre substrate for increased heat resistance of the package.

18. Use of a combination of an aluminium compound, a hydrophobic size and a wet-strength size for increased autoclaving heat resistance of a fibre-based packaging material, such as reduced raw-edge penetration, in autoclaving under pressure at a temperature of 100 to 250 °C for a time of 5 min to 30 h.

19. A Method for autoclave treatment of a package comprising a fibre-based packaging material treated with a hydrophobic size and comprising on the inside and/or outside of the fibre substrate one or more layers for reduced water penetration, **characterised** in that there is used a fibre substrate treated with a hydrophobic size, an aluminium compound and a wet-strength size for reduced raw-edge water penetration of the packaging material, the weight ratio of hydrophobic size to the aluminium compound being 1:0.1 – 1:10, and in that the autoclave treatment of the package is carried out under pressure with the aid of vapour at a temperature of 100 to 250 °C for a time of 5 min to 30 h.